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IS 4795-2 (1978): Holders for Indicator Lamps for Electronic and Telecommunication Equipment, Part 2: Type E10, E14 and BA9 [LITD 3: Electromechanical Components and Mechanical Structures for Electronic Equipment]



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IS : 4795 (Part II) - 1978

Indian Standard

SPECIFICATION FOR HOLDERS FOR
INDICATOR LAMPS FOR ELECTRONIC AND
TELECOMMUNICATION EQUIPMENT

PART II TYPE E10, E14 AND BA9

UDC 621.316.58:621.38/.39-038



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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Price Rs 8.50 Gr 5

July 1980

*Indian Standard*SPECIFICATION FOR HOLDERS FOR
INDICATOR LAMPS FOR ELECTRONIC AND
TELECOMMUNICATION EQUIPMENT**PART II TYPE E10, E14 AND BA9**Electromechanical Components for Electronic Equipment Sectional
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Indian Standard

SPECIFICATION FOR HOLDERS FOR INDICATOR LAMPS FOR ELECTRONIC AND TELECOMMUNICATION EQUIPMENT

PART II TYPE E10, E14 AND BA9

0. FOREWORD

0.1 This Indian Standard (Part II) was adopted by the Indian Standards Institution on 18 August 1978, after the draft finalized by the Electro-mechanical Components for Electronic Equipment Sectional Committee had been approved by the Electronics and Telecommunication Division Council.

0.2 This series of Indian Standards on holders for indicator lamps has been established with the object of specifying uniform requirements for electrical, mechanical and climatic properties as well as safety aspects. Test methods and dimensional details ensure interchangeability and compatibility.

0.3 This standard requires reference to IS : 4795 (Part I)-1968*, in which details of general requirements and tests have been fully covered. Only those requirements which are different for various types of lamp holders and other special conditions have been included in this standard.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard (Part II) covers dimensional and performance requirements for indicator lamp holders (scaled and non-scaled) of type E10, E14 and BA9.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS: 4795 (Part I)-1968* shall apply.

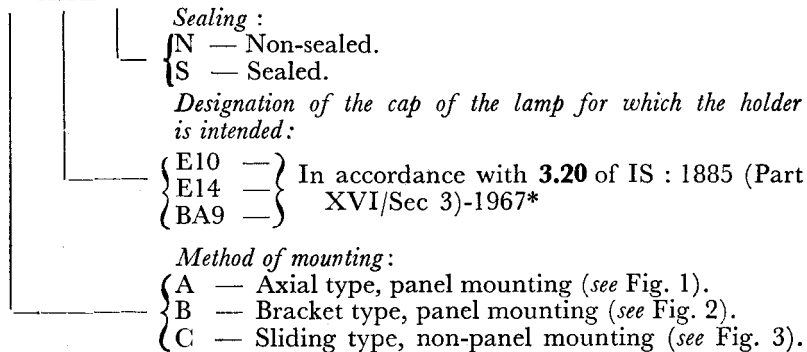
*Specification for holders for indicator lamps for electronic and telecommunication equipment: Part I General requirements and tests.

†Rules for rounding off numerical values (*revised*).

3. TYPE DESIGNATION

3.1 The type number will be composed as follows:

X XXX X



3.2 Example — A lamp holder designated as 'Type BBA9N' is:

- B — Bracket type.
- BA9 — For a lamp with BA9 cap.
- N — Non-sealed.

4. CLIMATIC SEVERITIES

4.1 Provisions of 3 of IS : 4795 (Part I)-1968† shall apply.

5. MATERIALS AND WORKMANSHIP

5.1 Provisions of 4 of IS : 4795 (Part I)-1968† shall apply.

6. ELECTRICAL RATINGS

6.1 Recommended rated voltage between terminals shall be as follows:

Type of Holder	E10	E14	BA9
Between terminals	100 V	250 V	100 V
Between terminals, and body	200 V	500 V	200 V

7. MARKING

7.1 Provisions of 6 of IS : 4795 (Part I)-1968† shall apply.

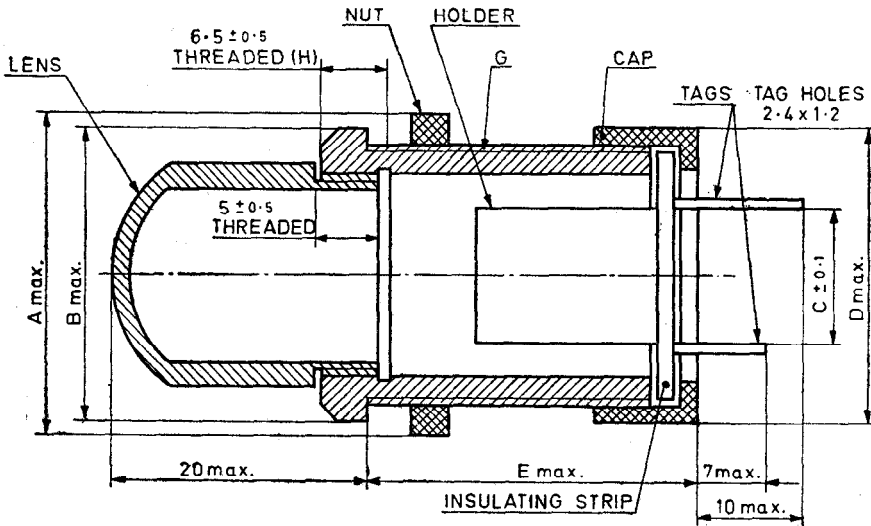
*Electrotechnical vocabulary: Part XVI Lighting, Section 3 Lamps and auxiliary apparatus.

†Specification for holders for indicator lamps for electronic and telecommunication equipment: Part I General requirements and tests.

8. DIMENSIONS

8.1 The dimensions shall comply with those specified in Fig. 1 to 5.

NOTE — Only those dimensions which are relevant to ensure interchangeability of the lamp holders have been specified. Other dimensions should be as agreed between the manufacturer and the customer.



Mounting hole $\phi = F \pm 0.1$

Dimension	Type E10 or BA9	Type E14
A	26	32
B	22	28
C	10.5	16
D	22	28
E	26	35
F	19	25
G	M18 × 1.5	M24 × 2
H	M14 × 1.5	M20 × 1.5

All dimensions in millimetres.

NOTE 1 — For detail dimensions of holder proper, see Fig. 4 or Fig. 5.

NOTE 2 — Tags can be replaced by screw terminals, which have a hole of 1.2 mm and screws of threads M2.5.

NOTE 3 — Dimension A is across corners for a hexagonal nut.

NOTE 4 — Threads according to IS : 4218 'ISO metric screw threads'. Fit for all threads 6 H/6 g.

FIG. 1 AXIAL TYPE, PANEL MOUNTING LAMP HOLDER SUITABLE FOR E10, E14 OR BA9 TYPE CAPS

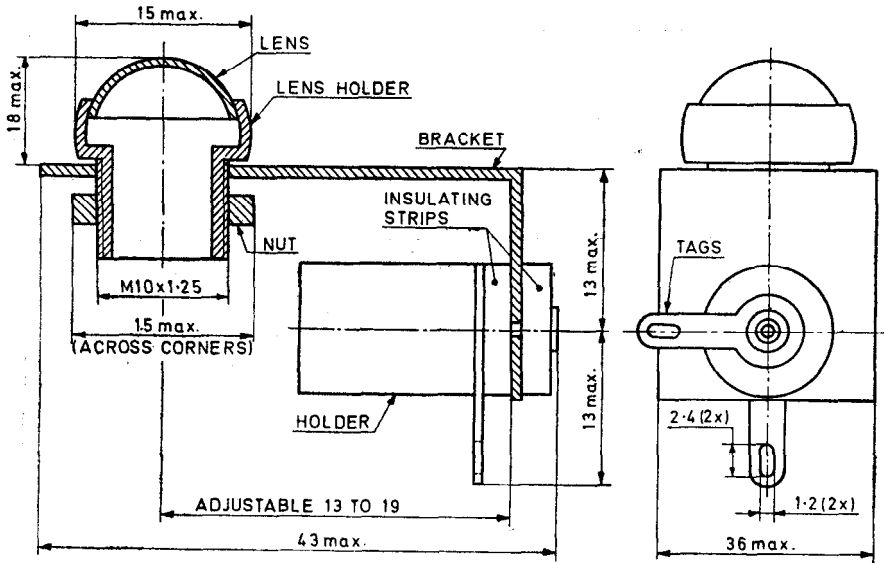
8.2 Checking by Gauges

8.2.1 The 'GO' and 'NO-GO' gauges for screw threads shall be according to Fig. 6.

The lamp holder threads shall be assumed to be correct if:

- a) The 'GO' gauge can be screwed-in smoothly, and
- b) The 'NO-GO' gauge does not enter by its own weight so far that the thread protrudes beyond surface *T*.

8.2.2 The 'GO' and 'NO-GO' gauges for bayonet type lamp holder BA9 shall be according to Fig. 7A.



Mounting hole ϕ : 10.5 ± 0.1

All dimensions in millimetres.

NOTE 1 — For detail dimensions of holder proper, see Fig. 4 or Fig. 5.

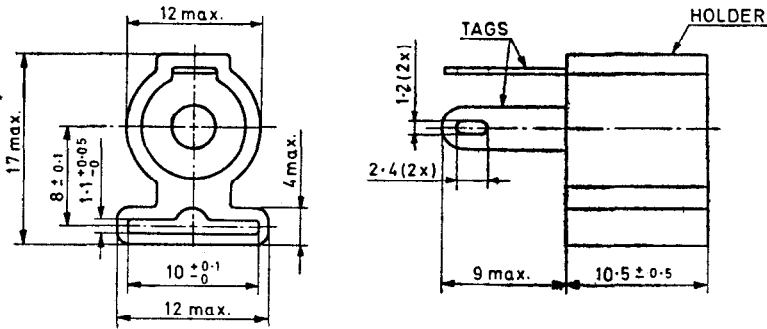
NOTE 2 — Threads according to IS : 4218 'ISO metric screw threads'.
Fit—6 H/6 g.

FIG. 2 BRACKET TYPE PANEL MOUNTING LAMP HOLDER SUITABLE FOR E10 OR BA9 TYPE OF CAPS

The lamp holder shall be assumed to be correct if: (a) the 'GO' gauge enters smoothly with uniform pressure, if the lamp holder has an elastic shell, the pressure may be somewhat higher; and (b) the 'NO-GO' gauge does not enter by its own weight. This test shall be carried out at least twice, the gauge being turned through 90°.

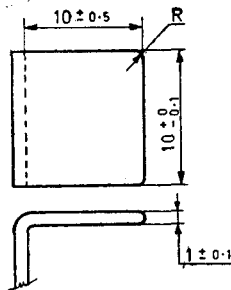
The slots in the bayonet type lamp holder shall be tested by using a gauge according to Fig. 7B.

The slot is assumed to be correct, if: (a) the 'GO' gauge enters the slot and passes under the projection until it stops in the resting place of the bayonet pins, and (b) the 'NO-GO' gauge does not enter the straight part of the slot.



NOTE — For detail dimensions of holder proper, see Fig. 4 or Fig. 5.

3A Sliding Type, Non-Panel Mounting Lamp Holder Suitable for E10 or BA9 Type Caps



3B Recommended Mounting Bracket Dimensions
All dimensions in millimetre.

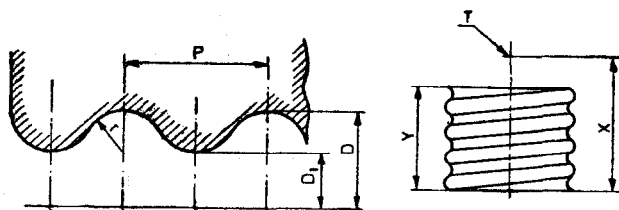
FIG. 3 SLIDING TYPE NON-PANEL MOUNTING LAMP HOLDER

8.3 Contact Depression Force

8.3.1 This shall be measured with the help of the gauge according to Fig. 8A for E10 and E14 type, and Fig. 8B for BA9 type lamp holders.

In case of E10 and E14 type the gauge shall be screwed in fully in the normal way. In case of BA9 type, the gauge should be inserted and turned so that the pins take the final position. Then the nut shall be turned till the gauge is firmly fixed in the specimen.

The moving central pin according to Fig. 8C shall touch the central spring or lip. The pin shall then be suitably loaded to depress it by 0.5 mm and the force required shall be measured.



4A Details of Threads of Lamp Holders

4B Details of Position of Central Contact in Relation to Holder Threads

Dimension	Type E10		Type E14	
	Min	Max	Min	Max
D	9.61	9.78	13.97	14.16
D ₁	8.59	8.76	12.37	12.56
P	1.814		2.822 2	
r	0.531		0.822	
X	7.5	9.3	12	15
Y	—	—	5	—

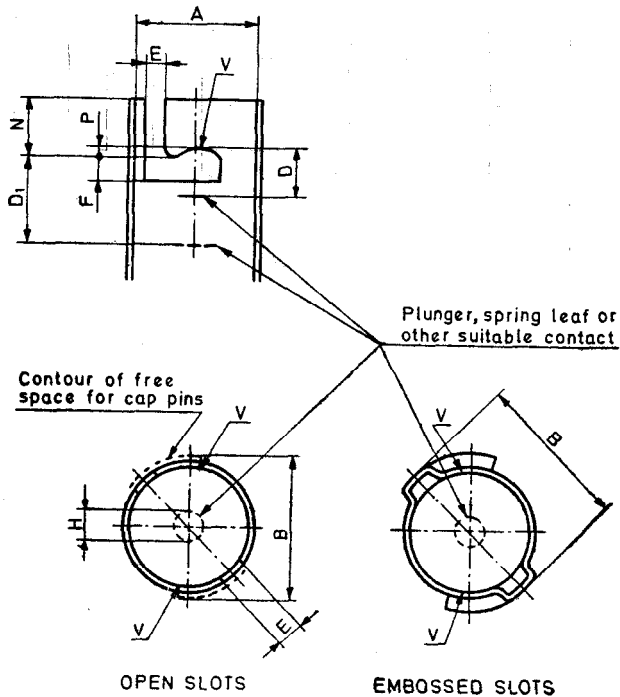
NOTE 1 — The drawing indicates only the dimensions to be controlled.

NOTE 2 — 'T' is the position of central contact when lamp is fully inserted.

NOTE 3 — The holder screw shall be positioned in the lamp holder so as to conform with dimension X when the lamp is fully inserted. It is not essential that the whole or any part of the holder screw is used as an electrical contact.

All dimensions in millimetres.

FIG. 4 DETAILS OF THREADS OF LAMP HOLDERS



<i>Dimension</i>	<i>Min</i>	<i>Max</i>
<i>A</i>	9.32	9.44
<i>B</i>	11.05	—
<i>D</i> (2)	—	3.8
<i>D</i> ₁ (3)	6.65	—
<i>E</i>	2.2	—
<i>F</i>	2.2	—
<i>H</i>	2.5	—
<i>N</i>	—	4.4
<i>P</i>	0.5	—

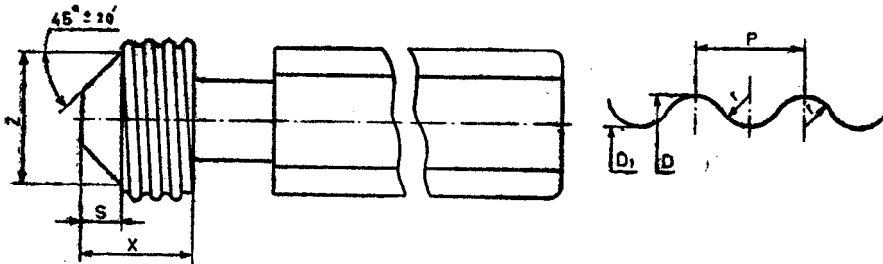
NOTE 1 — Departures from the cylindrical form are allowed. However, dimension A shall be maintained immediately above the resting points V and also at other positions between resting points to provide an equivalent means of support.

NOTE 2 — V is the resting point of cap pins.

NOTE 3 — The drawing indicates only dimensions which are to be controlled.

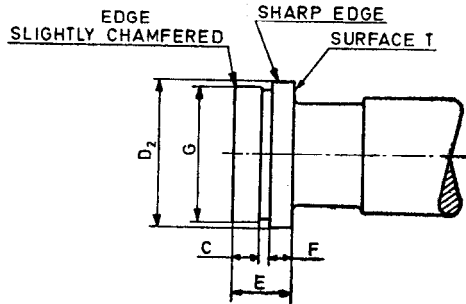
All dimensions in millimetres.

FIG. 5 DETAIL DIMENSIONS OF BAYONET TYPE LAMP HOLDER



Dimension	Type E10	Type E14
D $\begin{matrix} +0 \\ -0.02 \end{matrix}$	9.6	13.97
D ₁ $\begin{matrix} +0 \\ -0.02 \end{matrix}$	8.59	12.37
P	1.814	2.822
S $\begin{matrix} +0 \\ -0.03 \end{matrix}$	2.5	3.5
X $\begin{matrix} +0 \\ -0.03 \end{matrix}$	8.0	15.0
Z	8.0	12.0
r	0.531	0.822

6A 'Go' Gauge



Dimension	Type E10	Type E14
C $\begin{matrix} +0 \\ -0.2 \end{matrix}$	2.0	4.0
D ₂ $\begin{matrix} +0.01 \\ -0 \end{matrix}$	8.76	12.56
E $\begin{matrix} +0 \\ -0.2 \end{matrix}$	5.0	8.0
F $\begin{matrix} +0 \\ -0.1 \end{matrix}$	2.0	3.0
G* $\begin{matrix} +0 \\ -0.04 \end{matrix}$	8.55	12.33

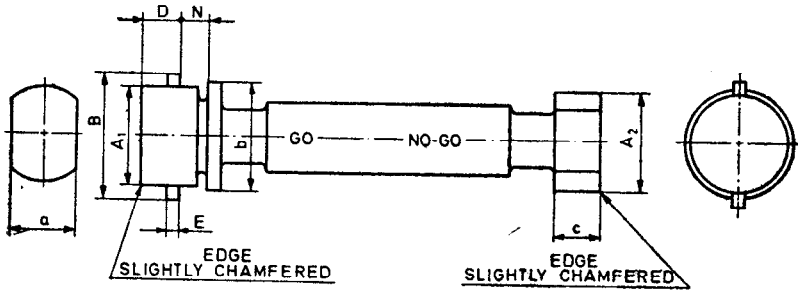
Mass, kg	Type E10		Type E14	
	Min	Max	Min	Max
	0.063	0.077	0.108	0.132

*For centering purposes only.

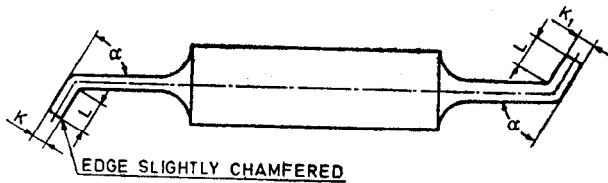
6B 'No-Go' Gauge

NOTE — The drawing is intended to illustrate the essential dimensions of the gauges.
All dimensions in millimetres.

FIG. 6 GAUGES FOR SCREW THREADS OF LAMP HOLDERS



7A 'Go' and 'No-Go' Gauge for Bayonet Type Lamp Holder



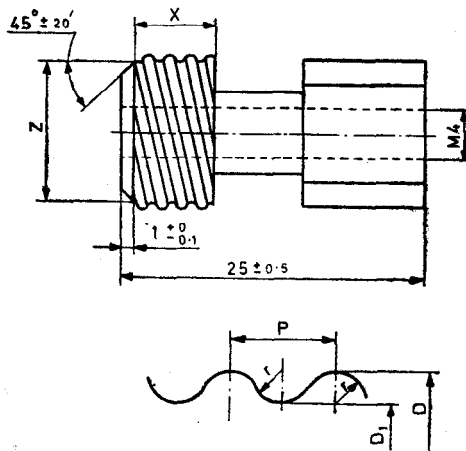
7B 'Go' and 'No-Go' Gauge for Slots of Bayonet Type Lamp Holder

Dimension	Type BA9
A_1	$+0.0$ -0.01
A_2	$+0.01$ -0
N	$+0.02$ -0
E	$+0$ -0.01
D	$+0$ -0.01
a	$+1.0$ -0
b	$+0.5$ -0
c	$+1.0$ -0
B	$+0$ -0.01
K	$+0$ -0.01
K_1	$+0.01$ -0
L	$+0.5$ -0
α	Approx 60°

NOTE — The drawing is intended only to illustrate the essential dimensions of the gauges.

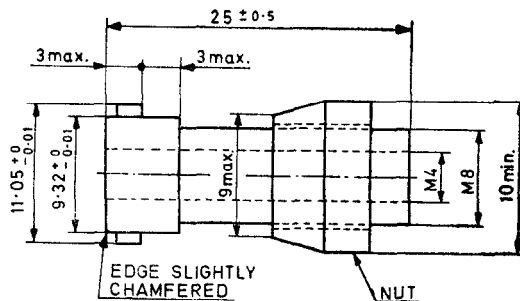
All dimensions in millimetres.

FIG. 7 GAUGES FOR BAYONET TYPE LAMP HOLDER



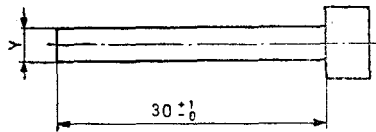
Dimension	Type E10	Type E14	
D	$+0$ -0.02	9.6	13.97
D_1	$+0$ -0.02	8.59	12.37
P		1.814	2.822
X	0 -0.5	5.5	11.5
Z		8.0	12.0
r		0.531	0.822

8A Gauge for Measuring Contact Pressure for E10 and E14 Type Holders



8B Gauge for Measuring Contact Pressure for BA9 Type Holders

FIG. 8 GAUGES FOR MEASURING CONTACT PRESSURE FOR LAMP HOLDER—Contd



$$r = \begin{matrix} +0 \\ 3 \\ -0.1 \end{matrix} \text{ For contact depression force test and mechanical endurance test, and} \\ = M_4 \text{ For vibration test.}$$

8C Pin

NOTE — The drawings are intended only to illustrate the essential dimensions of the gauge.

All dimensions in millimetres.

FIG. 8 GAUGES FOR MEASURING CONTACT PRESSURE FOR LAMP HOLDER

8.3.2 The force shall be greater than or equal to 5N but shall be less than 10N.

9. TESTS

9.1 Classification of Tests — Provisions of 7.1 of IS : 4795 (Part I)-1968* shall apply.

9.2 Conditions for Tests — Provisions of 7.2 of IS : 4795 (Part I)-1968* shall apply.

9.3 Test Schedule

9.3.1 The sequence of tests shall be as specified in Appendix A of IS : 4795 (Part I)-1968*.

9.3.2 Conditions of tests and requirements which according to IS : 4795 (Part I)-1968* were to be included in individual specifications have been given specifically in col 3 and 4 of Table 1. Unless otherwise specified as above, conditions of tests and requirements shall be according to relevant clauses of IS : 4795 (Part I)-1968* for the tests mentioned in col 2 of Table 1.

9.3.3 The conditions of tests and requirements are applicable both for acceptance tests and type tests. The grouping into lots is applicable to type tests only.

*Specification for indicator lamps for electronic and telecommunication equipment : Part I General requirements and tests.

TABLE 1 TEST SCHEDULE

(Clause 9.3.2)

Sl No.	TEST	CLAUSE REF OF IS: 4795 (PART I)-1968*	CONDITIONS OF TEST	REQUIREMENTS
(1)	(2)	(3)	(4)	(5)
i)	All Samples (22)			
a)	General examination	7.5.1	—	—
b)	Dimensions	7.5.2	—	In accordance with 8.1
c)	Checking by gauges	7.5.3	—	In accordance with 8.2
d)	Contact pressure	7.5.4	—	In accordance with 8.3
e)	Insulation resistance	7.3.3	—	—
f)	Voltage proof	7.3.2	2 times the voltage specified in 6.1	—
g)	Corona	7.3.5	—	Not less than: For E10 and BA9-1 500 Vac, and for B14-2 000 Vac
h)	RF shunt resistance	7.3.4	—	Not less than 5k Ω
j)	Sealing (where applicable)	7.5.10	—	—
k)	Sliding force	7.5.7.1	—	10 N
m)	Torque			
	Fixing	7.5.7.1	—	350 Ncm
	Lens	7.5.7.2	—	200 Ncm
	Dimmer	7.5.7.3	—	—
ii)	First Lot (4 samples)			
a)	Robustness of terminations	7.5.6	Loading weight for tensile test: 20N	—
b)	Soldering	7.5.5	Method 2 of 7.18.3 of IS: 589-1961† Period of recovery shall be 1 hour	—
c)	Bump	7.5.9	—	—

*Specification for holders of or indicator lamps for electronic and telecommunication equipment : Part I General requirements and tests.

†Basic climatic and mechanical durability tests for electronic components (*revised*).

(Continued)

TABLE I TEST SCHEDULE — *Contd*

Sl. No.	TEST	CLAUSE REF OF IS: 4795 (PART I)-1968*	CONDITIONS OF TEST	REQUIREMENTS
(1)	(2)	(3)	(4)	(5)
d)	Vibration	7.5.8	<i>Category I and II</i> Severity: —Frequency: 10 to 2 000 Hz —Acceleration amplitude 20 g —Duration : 12 h <i>Category III</i> Severity: —Frequency: 10 to 55 Hz —Displacement amplitude: 0.75 mm —Duration: 6 h	
	1) Sealing (for sealed type)	7.5.10	—	Leakage rate: 2 cc/h
e)	Rapid change of temperature (where applicable)	7.6.3	—	—
	1) Voltage-proof	7.3.2	—	—
	2) Insulation resistance	7.3.3	—	—
	3) General examination	7.5.1	—	—
f)	Climatic sequence	7.6.1	—	—
	1) Dry heat	7.6.1.1	—	—
	i) Insulation resistance	7.3.3	—	5 M Ω between terminals, and 25 M Ω between terminals shorted and earth
	ii) Sealing (for sealed type)	7.5.10	—	Leakage rate: 2 cc/h
	2) Damp heat (accelerated) first cycle	7.6.1.2	—	—
	i) Cold	7.6.1.3	—	—
	ii) Low air pressure	7.6.1.4	—	—
	iii) Damp heat (accelerated) remaining cycles	7.6.1.5	—	—

*Specification for holders for indicator lamps for electronic and telecommunication equipment : Part I General requirements and tests.

(Continued)

TABLE 1 TEST SCHEDULE — *Contd*

Sl No.	TEST	CLAUSE REF OF IS: 4795 (PART I)- 1968*	CONDITIONS OF TEST	REQUIREMENTS
(1)	(2)	(3)	(4)	(5)
	3) Final measurement	7.6.1.6	—	—
	i) Voltage-proof	7.3.2	—	—
	ii) Insulation resistance	7.3.3	—	—
	iii) Sealing (where applicable)	7.5.10	—	—
	iv) General examination	7.5.1	—	—
<i>iii)</i>	Second Lot (4 samples)			
	a) Damp heat (long term exposure)	7.6.2	Working voltage as specified in 6.1	—
	1) Voltage-proof	7.3.2	1.5× working voltage as specified in 6.1 to be applied	—
	2) Insulation resistance	7.3.3	—	5 M Ω between adjacent terminals, and 25 M Ω between terminals connected together and earth
	3) Sealing (where applicable)	7.5.10	—	Leakage rate: 2 cc/h
	4) General examination	7.5.1	—	—
<i>iv)</i>	Third Lot (8 samples)			
	a) Endurance test (electrical) (4 samples)	7.7	—	—
	1) Voltage-proof	7.3.2	1.5 working voltage specified in 6.1	—
	2) Insulation resistance	7.3.3	—	5 M Ω between adjacent terminals, and 25 M Ω between terminals connected together and earth
	3) Sealing (where applicable)	7.5.10	—	Leakage rate: 2 cm ³ /h

*Specification for holders for indicator lamps for electronic and telecommunication equipment : Part I General requirements and tests.

(Continued)

TABLE 1 TEST SCHEDULE — *Contd*

SL No.	TEST	CLAUSE REF OF IS: 4795 (PART I)-1968*	CONDITIONS OF TEST	REQUIREMENTS
(1)	(2)	(3)	(4)	(5)
b)	Endurance test (mechanical) (4 samples)	7.8	—	—
v)	Fourth Lot			
a)	Salt mist (2 samples)	7.6.4	—	—
vi)	Fifth Lot (4 samples)			
a)	Storage	7.6.5	—	—
	1) Voltage-proof	7.3.2	—	—
	2) Insulation resistance	7.3.3	—	—
	3) Soldering	7.5.5	—	—
	4) General examination	7.5.1	—	—

*Specification for holders for indicator lamps for electronic and telecommunication equipment : Part I General requirements and tests.

INDIAN STANDARDS

ON

ELECTROMECHANICAL COMPONENTS FOR ELECTRONIC EQUIPMENT

IS:

- 1885 (Part XXVI)-1968 Electrotechnical vocabulary: Part XXVI Telecommunication relays
- 2612-1965 Recommendation for type approval and sampling procedures for electronic components
- 2628 (Part I)-1964 Rotary wafer switches (low current rating): Part I Tests and general requirements
- 2628 (Part II)-1967 Rotary wafer switches (low current rating): Part II Rotary wafer switches with central mounting
- 3354 (Part I)-1965 Valve sockets: Part I General requirements and tests
- 3354 (Part II)-1965 Valve sockets: Part II Dimensions and construction of gauges and tools
- 3354 (Part III)-1967 Valve sockets: Part III Valve sockets for octal base
- 3354 (Part IV)-1967 Valve sockets: Part IV Valve sockets for 9-pin miniature base
- 3452 (Part I)-1966 Toggle switches: Part I General requirements and tests
- 3452 (Part II)-1970 Toggle switches: Part II Toggle switches, Type I and Type II
- 3544-1966 General requirements and test for tag strips
- 4007 (Part I)-1967 Terminals for electronic equipment: Part I General requirements and tests
- 4586-1968 Dimensions of spindles and details of mechanical fixing devices used in electronic equipment
- 4794 (Part I)-1968 Push-button switches: Part I General requirements and tests
- 4795 (Part I)-1968 Holders for indicator lamps for electronic and telecommunication equipment: Part I General requirements and tests
- 4795 (Part II)-1978 Specification for holders for indicator lamps for electronic and telecommunication equipment: Part II Type E10, E14 and BA9
- 5033-1969 Telescopic aerials for portable radio receivers
- 5051 (Part I)-1969 Non-sealed electromagnetic relays for electronic and telecommunication equipment: Part I General requirements and tests
- 6089 (Part I)-1971 Sensitive switches: Part I General requirements and tests
- 6102 (Part I)-1971 Finger knobs used in electronic and telecommunication equipment: Part I General requirements and tests
- 7542 (Part I)-1974 Tube shields: Part I General requirements and tests
- 7751 (Part I)-1975 Slide switches: Part I General requirements and tests

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>	<i>Definition</i>
Force	newton	N	1 N = 1 kg.m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²

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